

## Heat stress in animals

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### ABSTRACT

Heat stress arises when body temperature of animal increases than its normal body temperature. Due to increase in the body temperature, metabolic and physiological changes occur which have unwanted effect on animal body. On the occasion of Eid ul Adha in Muslim countries animals suffer more from heat stress due to overcrowding of animals in inadequate space in markets. There are many reasons of heat stress in animals like high environmental temperature, high humidity, lack of shade, inadequate ventilation, lack of water, overcrowding, transportation, breed and species susceptibility and Pre-existing health conditionings etc. Due to these conditions, there are many damaging effects on animals which include increase body temperature, dehydration, reduce feed intake, decrease milk yield and production, heat stroke and respiratory distress etc. We should take preventive measures to reduce heat stress like adequate shade, proper ventilation, water availability, adjust feeding practices, avoid overcrowding and provide proper resting areas etc.

**Keywords** heat, heat stress, high temperature

### 1. Introduction

When the normal body temperature elevates, heat stress arises [1]. There are many reasons for this increase in the body temperature of the animal. Many metabolic and physiological changes occur due to the increment in temperature, which have undesirable effects on the body of the animal. Normal body functions get disturbed due to high temperature and most of the animals get heat stress. During the Eid season (Eid-ul-Adha) which is the most significant event celebrated in all of the Muslim countries, animals are gathered in markets in a large number. Due to the large number of the animals in a market where there is inadequate space for all them, body temperature rises and ultimately animals get heat stress.

### 2. Causes:

**2.1 High environmental temperature:** High temperature of the environment is the most common cause of heat stress in animals. This happens when the temperature of the environment becomes higher than the normal body temperature of the animal. Animal is unable to regulate its normal body activities due to the exchange of heat energy [2].

**2.2 High humidity:** Animals dissipate their heat through evaporative cooling which is directly affected by the humidity level. Evaporative cooling includes sweating or panting like processes. Evaporation rate decreases with the increase in the humidity level which will hinder the ability of animal to cool down, ultimately leading to heat stress [3].

**2.3 Lack of shade:** Proper amount of shade is needed where animal should reside to avoid the direct sunlight. Adequate amount of shade helps the animal to relief from the high environmental temperature. When the suitable shade is absent, heat stress occurs [4].

**2.4 Inadequate ventilation:** In farms and sheds, where there is lack of ventilation and air flow is poor, animals are more predisposed to heat stress. Proper ventilation is needed so that the warm air doesn't trap in the shed and adequate air exchange process continues. This will lead to lower the temperature of shed [5].

**2.5 Lack of water:** Animals regulate their body temperature through cooling processes like panting and sweating etc. So, proper hydration is badly needed specially in summer season. Lack of free access of animals to water or farms having limited resources, animals may suffer from heat stress [6].

**2.6 Overcrowding:** When large number of animals are placed in an area where there is inadequate or confined space for all of the animals, suffocation occurs. This overcrowding limit the animals to find proper space for their normal body mechanisms and they get restricted to dissipate heat [7].

**2.7 Transportation:** Transportation during the summer season or high environmental temperature in vehicles with poor ventilation give animals heat stress. This combination of high temperature and poor ventilation is very challenging for the animals. Most of the animals don't bear this severe condition [8].

**2.8 Breed and species susceptibility:** Heat tolerance ability of the animals vary from breed to breed. Some breeds can bear high temperature easily and some breeds can't bear a moderate high temperature. Mostly the exogenous breeds in Pakistan are most susceptible to heat stress while indigenous breeds are somehow heat resist [9].

**2.9 Pre-existing health conditions:** Animals with compromised thermoregulatory system or respiratory issues are most prone to heat stress. These pre-existing health problems reduces the ability of animals to deal with elevated temperature and puts them at higher risk [10].

### 3. Effects:

Heat stress can have noteworthy effects on the health of animals, especially the animals which are not able to resist high temperate. Some major effects are given as:

**3.1 Increased body temperature:** Hyperthermic condition develops due to elevated body temperature of the animal. In this condition animal is unable to cool down by itself. Many physiological and metabolic changes occur due to high body temperature [11].

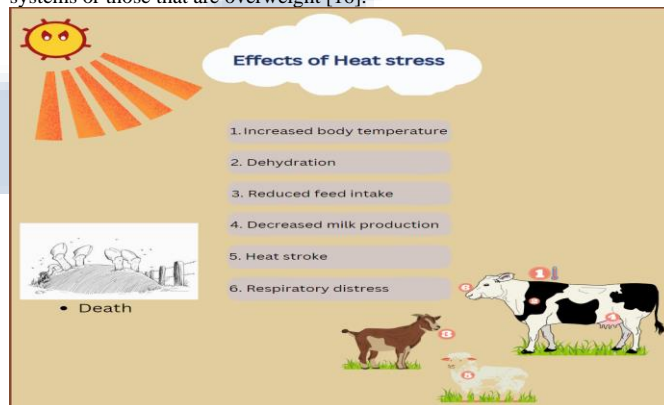
**3.2 Dehydration:** Evaporation rate increases with the increase in the body temperature, leading to the loss of the water from the body through panting and sweating. Loss of excessive amount of water from the body leads to dehydration. We should provide animals adequate amount of water to compensate the water loss [12].

**3.3 Reduced feed intake:** Heat stress in the animals cause reduced appetite. Palatability of feed stuff is directly affected by heat. Feed intake of animal suffering from the heat stress is reduced due to the increased demand of thermoregulation for the metabolic processes of the body. Animal become weak and immunity to fight back is also reduced [13].

**3.4 Decreased milk production:** Lactating and dairy cows suffering from heat stress may experience drop in the milk production. Reduced feed intake also plays its part in this reduction of milk production. Milk producing cows are too much sensitive to heat, increased temperature cause decline in their performance. Alteration in milk composition can also occur like increase in milk protein and reduced milk fat [14].

**3.5 Heat stroke:** It is a death dealing condition which happens due to continued exposure to heat. When the body temperature of the animal rises up to a critical point, potential death and dysfunction of the organs occur if not treated instantly [15].

**3.6 Respiratory distress:** Heat stress can result in increased respiratory rate and effort as animals attempt to dissipate heat through panting. This can lead to respiratory distress, especially in animals with compromised respiratory systems or those that are overweight [16].



### 4. Prevention:

Preventive measures to overcome heat stress are given as follows:

1. Adequate shade
2. Proper ventilation
3. Water availability

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4. Cooling mechanisms
5. Adjust feeding practices
6. Avoid overcrowding
7. Schedule activities appropriately
8. Monitor animals closely
9. Provide resting areas
10. Consider breed and species requirements

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